

REMARKS

Claims 1-17 and 19-22 are now pending in the present application. The Examiner indicated that Claim 16 has allowable subject matter and Claim 5 would be allowable if rewritten in independent form. Minor amendments have been made to the abstract of the specification and the claims to overcome the objections to the specification and the claims. The amendments to Claims 5 and 8 contained herein are of equivalent scope as originally filed and, thus, are not narrowing amendments. Claim 18 has been cancelled. Claims 17, 19, 21, and 22 have been amended to clarify and more particularly point out the present invention. Support for amendments in Claims 17, 19, 21 and 22 is found in Applicant's specification, for example, at Paragraphs 39, 42, 43, and 44. The Examiner is respectfully requested to enter these amendments and reconsider and withdraw the objections and rejections in view of the amendments and remarks contained herein.

OBJECTIONS

The abstract of the disclosure stands objected to for the use of the word "said". The third sentence of the abstract has been amended to recite "the media". Claims 5, 8 and 17 also stand objected to for certain informalities. Applicant has amended Claims 5, 8 and 17 to address the Examiner's objections. Therefore, reconsideration and withdrawal of these objections are respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-4, 8, 9 and 17-22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Wild (U.S. Pat. No. 5,333,612), hereinafter the "Wild" reference. Claims 1-3, 6, 8 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kossoff et al. (U.S. Pat. No. 4,455,872), hereinafter the "Kossoff" reference. These rejections are respectfully traversed.

Wild discloses a transducer element that does not rotate, rather it moves in straight line motion in a diametric path across the housing, which is facilitated by a ring gear (26). Col. 1 lines 44 -52; Col. 2 lines 19 -56; Col. 3 lines 49-53; and Col. 4 lines 16-29. However, the ring gear 26 is not a support structure or a stage. (See Figure 3). The transducer in Wild is supported on activating bars 28a and 28b that provide oscillatory movement to the transducer. Col. 3 line 59 and Col. 4 lines 5-10. As such, Wild does not disclose a transducer mounted on a stage. Further, Wild does not disclose or suggest a support structure that has a proximal end adjacent to and coupled to such a stage, as recited in Claim 1. As such, Wild does not anticipate Claim 1, nor Claims 2-4, 8 and 9, which depend therefrom. Thus, Applicant respectfully requests withdrawal of the present rejection and allowance of Claim 1, as well as of Claims 2-4, 8 and 9.

Claim 17 has been amended to more particularly point out the subject matter recited therein. The Wild reference does not disclose positioning an ultrasonic detection assembly over a target, where the detection assembly comprises an ultrasonic transducer and a support structure having a proximal end adjacent to the ultrasonic transducer and a terminal end opposite to the proximal end that is contacted with the

target. Rather, Wild discloses a transducer contained in the middle of an interior of a housing container (not adjacent to either end), where the entire drive mechanism and transducer are contained inside and immersed within confined liquid. Col. 3 lines 6-7; Col. 3 lines 22-25; and Figure 2. Wild does not disclose rotating the transducer relative to an adjacent proximal end of a support structure of a detection assembly to reposition the transducer. As the Examiner points out, the Wild reference fails to disclose a phased array ultrasonic transducer of any type. Hence, Wild does not disclose or suggest the recited limitations of Claim 17 or its dependent Claims 19-22. Accordingly, Applicant submits that Claims 1-4, 8, 9, 17, and 19-22 are not rendered obvious by Wild, and respectfully request withdrawal of the rejection and reconsideration of the claims.

Claims 1-3, 6, 8 and 14 stand rejected as being anticipated by Kossoff. Applicant traverses this rejection. Kossoff does not disclose a transducer mounted on a stage that is adjacent to a proximal end of a support structure, as in Claim 1 and its dependent claims. Rather, Kossoff discloses an ultrasonic transducer disposed entirely within a storage housing (near neither end of the storage housing) and immersed within a transmission fluid. Thus Kossoff does not disclose or suggest a transducer mounted on a stage adjacent to a proximal end of a support structure. Accordingly, Kossoff does not anticipate Claim 1 or dependent Claims 2-3, 6, 8, and 14, and Applicant requests withdrawal of the rejection and reconsideration and allowance of the claims.

REJECTION UNDER 35 U.S.C. § 103

Claims 10, 11, 13 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Wild reference. Claims 6, 12 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wild in view of the Kossoff reference. Claims 7 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kossoff. These rejections are respectfully traversed.

For the reasons stated above, the Wild reference does not disclose the limitations recited in Claim 1, nor does it disclose or suggest the subject matter recited in Claims 10, 11, 13 and 15. Wild does not disclose or suggest mounting a transducer on a stage or a platform that is adjacent to a proximal end of a support structure containing the fluid media, nor does the Wild patent provide any motivation to support such a change. Thus, there is no *prima facie* case of obviousness.

In addition, the Wild reference does not disclose or suggest a compliant polymeric material diaphragm, as recited in Claim 10. Wild relates to ultrasonic imaging of a soft body part (*i.e.*, a human breast), rather than a small resistance weld spot nugget, which is potentially abrasive or sharp. Thus, there would be no suggestion to replace the Wild patent's cosmetic-grade material used for contact with a human body with a durable compliant polymeric material that protrudes under head pressure of the couplant media to enhance the interface with the target surface for an industrial application. As such, there is no disclosure or suggestion of the subject matter recited in Claim 10.

As the Wild reference does not disclose a transducer mounted on a stage adjacent to a proximal end of a support structure, there is no suggestion to couple the stage to the support structure by a retaining ring having a ring gear as is recited in Claim 13.

Nor is there any suggestion as to appropriate dimensions of the support structure, such as a support structure having a length of less than about 25 mm as recited in Claim 15. First, both Wild and Kossoff disclose a bulky ultrasonic transducer contained within the support structure itself. Wild: Figure 2 and Kossoff: Figure 1; Col. 2 lines 68 and Col. 3 lines 15-16. One of skill in the art would not be motivated to arrive at a support structure of less than 25 mm, where a physically large transducer has to be contained within the structure.

Notwithstanding the physical limitations of the support structures, both the Wild and the Kossoff references relate to ultrasonic imaging of a human breast. The principles of an ultrasonic transducer generally require a working distance (between the transducer and the target) to be at least twice the maximum thickness of the object to be inspected. See for example, Applicant's specification at Paragraph [0028]. Thus, one of skill in the art would immediately recognize that a working distance of 25 mm would equate to a maximum target thickness of at the most 12.5 mm, which would render both Wild and Kossoff inoperable for their intended use. As such, neither Wild, nor Wild combined with Kossoff, provide a *prima facie* case of obviousness and do not render Claims 10, 11, 13 and 15 obvious. Thus, Applicant respectfully requests that the rejections be withdrawn and the claims be reconsidered and allowed.

Claims 6, 12 and 14 stand rejected under as being obvious over Wild in view of Kossoff. As discussed above, neither the Wild reference by itself or combined with the Kossoff reference, disclose all of the elements of independent Claim 1, from which Claims 6, 12, and 14 depend. Wild and Kossoff both disclose ultrasonic transducers contained within the support structure itself. Wild: Figure 2 and Kossoff: Figure 1; Col. 2 lines 68 and Col. 3 lines 15-16. Kossoff discloses that the transducer can be moved within the support structure in a “Z” direction to provide optimal focusing to the target. Kossoff has no disclosure or suggestion to design an interior space of a support structure (from a proximal end to a terminal end) to optimize the shape of an ultrasonic beam emitted from a transducer, such as in Claim 6. As such, neither Wild, nor Wild combined with Kossoff, disclose or suggest a transducer adjacent to a proximal end of a support structure, thus there is no *prima facie* case of obviousness, and there is no motivation to optimize the dimensions of the interior of a support structure from a proximal end to a terminal end to optimize a shape of an ultrasonic beam, as recited in Claim 6.

Further, Claim 12 recites establishing a continuous flow of couplant media through an aperture in a terminal end of a support structure to a target. Neither Wild, nor Wild combined with Kossoff disclose or suggest providing an aperture in the terminal end for a “dribbler” that establishes a continuous flow of couplant media down to the target surface. Wild discloses a device that is pressed against the human body. There is no disclosure, suggestion, or motivation to improve an interface with the target surface whatsoever, let alone for providing an aperture in a terminal end of a support structure that releases a continuous flow of couplant media. Kossoff does not account

for this deficiency. Rather Kossoff discloses a “water tank,” where the body part is “immersed in the water contained in the tank” and then upwardly scanned. Figure 1, Col. 3 line 44 and lines 57-58. Thus, there would be no need to provide a continuous flow through a dribbler type aperture between the support structure and target surface, because the body part is immersed within the media. As such, there is no disclosure, motivation, or suggestion to arrive at the subject matter of Claim 12, regardless of the knowledge of one of skill in the art, and as such Claim 12 is non-obvious over Wild in light of Kossoff.

Claim 14 also stands rejected over Wild in light of Kossoff. Neither Wild nor Kossoff disclose a high frequency, linear phased array ultrasonic transducer, that has particular suitability for scanning resistance spot welds, as is recited in Claim 14. Further, Wild teaches away from combination with Kossoff, because Wild provides for transducer movement in multiple diametric, straight line paths. See Col. 1 lines 45-52, Col. 4 lines 20-21 and line 27, for example. Wild states an objective is to move an ultrasound transducer (for scanning a female breast) in straight line sections across and conforming to the breast. Col. 2 lines 42-49. The scans are likened to that of sections of “an orange”, where diametric path and circumferential indexing simulates the “sectorial pattern of the breast and likened orange.” Col. 4 lines 36-45. Thus, Wild discloses an apparatus that translates a single transducer in diametric straight line paths to provide comprehensive imaging, thus one of skill in the art would not be motivated to provide a linear phased array ultrasonic transducer in such a device that already sufficiently provides diametric sections with a single transducer. As such, Wild does not suggest or motivate combination with Kossoff. Further, Kossoff does not

disclose a high frequency linear phased array ultrasonic transducer, as recited in Claim 14. Neither Wild nor Kossoff render Claim 14 non-obvious, and Applicant respectfully requests withdrawal of the rejection and allowance of the claim.

Claims 7 and 15 stand rejected as being obvious over Kossoff. Claim 7 is dependent upon Claim 1 discussed above, and recites a stage and support structure coupled to one another by a coupling that comprises a seal to prevent or at least minimize leakage of fluid from a proximal end of the interior space to an exterior of the assembly. As previously discussed, Kossoff does not disclose or suggest a transducer mounted on a stage adjacent to a proximal end of a support structure. Thus, Kossoff does not disclose, suggest, or motivate one of skill in the art to arrive at a stage and support structure adjacent and coupled to one another at proximal end, where the coupling is a seal. Further, Kossoff generally operates by the principle of a tank that is open and accessible for immersion of a body part. Figure 1, Col. 3 line 44 and lines 57-58. Thus, Kossoff teaches away from providing a seal between the target and coupling fluid. Applicant submits that Claim 7 is non-obvious in light of Kossoff and is in condition for allowance.

Finally, Claim 15 recites that a support structure has a length of less than about 25 mm. As discussed above, Kossoff discloses a large ultrasonic transducer contained within the support structure itself. Figure 1; Col. 2 lines 68 and Col. 3 lines 15-16. One of skill in the art would not be motivated to provide a support structure of less than 25 mm, where a bulky transducer must be contained within the structure. Notwithstanding the physical limitations of the support structure disclosed in Kossoff, the principles of an ultrasonic transducer generally require a working distance (between the transducer and

the target) to be at least twice the maximum thickness of the object to be inspected. See for example, Applicant's specification at Paragraph [0028]. Thus, since Kossoff is used to scan a human breast, one of skill in the art would immediately recognize that a working distance of 25 mm would equate to a maximum target thickness of at the most 12.5 mm, which would be unsuitable and would render Kossoff inoperable for its intended use. As such, Kossoff does not render Claim 15 obvious and Applicant respectfully requests that the rejection be withdrawn and the claim allowed.

ALLOWABLE SUBJECT MATTER

The Examiner indicated that Claim 16 is allowed, and Claim 5 would be allowable over the cited art of record if rewritten in independent form. Applicant thanks the Examiner for the thorough consideration of the claims and allowance of the indicated claims.

INFORMATION DISCLOSURE STATEMENT

Applicant submits that the omission of the publication listed in the Information Disclosure Statement filed on December 11, 2003 was inadvertent and encloses a copy of the subject publication for the Examiner's review herewith.


CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is

believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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